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REPORT OF A CASE OF LARGE INTRA-CRANIAL TUMOR (WEIGHT, FIVE OUNCES) COMPRESSING THE LEFT FRONTAL LOBE.[1]

BY WILLIAM H. MORRISON, M.D.,
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I REGRET to say that the specimen of intra-cranial tumor which I present to-night is mainly of pathologic interest. A study of the case from which it was removed teaches little in regard to symptomatology, and points out few indications for treatment. It adds another to the long list of cases already reported of large lesions of the frontal lobes without symptoms. The patient was under my care for a short time several years ago, and again for two days before his death, but in the intervening period I had no opportunity of studying his condition. He was under treatment for short periods by various regular and irregular practitioners, and at one time spent six weeks in the Pennsylvania Hospital, but during the two years preceding death he was subjected to no scientific study. This is unfortunate, for doubtless a careful study of this patient would have thrown some light upon these obscure cases, and have helped to give us aid in the

[1] Read before the Philadelphia Neurological Society, October 24, 1802.

recognition of lesions of this part of the brain. The history, as I shall give it, is made up principally from the statements of his friends and from the notes in the case-book of the Pennsylvania Hospital.

A. C., colored, about forty years of age, came under my observation in April, 1886. At this time he was a coachman by occupation, but had been in the army and had also served as a sailor, and was said to have suffered shipwreck on one or two occasions. He complained of pains in the head, which I attributed to localized syphilitic meningitis, and placed him upon potassium iodide. I saw him three or four times in the next few weeks, and then he passed from my observation and was not seen again until two days before death. In the summer of 1888 he had an epileptiform convulsion, which was the only convulsion in the history of the case. The pains in the head returned and gradually increased in severity, and were especially marked on stooping. In August, 1889, he gave up his work, but for a month before this his friends had noticed that his speech was slower than usual. Shortly after quitting work his eyesight began to fail, and soon he was unable to recognize persons or objects at a short distance from him. The pain seemed to be rather in the occipital region, although on stooping pain would be felt in the frontal region. During the last six or nine months of the history the pain was not so severe, and at no time does it seem to have been a marked symptom. A few months after quitting work he was admitted to the Pennsylvania Hospital. The notes of the case in the record-book of that institution are as follows:

"A. C., colored, coachman. Admitted Decem-

ber 9, 1889. Discharged January 20, 1890. Diagnosis, neuro-retinitis.

"Mother and father died of old age; other members of the family living and healthy. He says that he was never sick before. There is no venereal history. The present sickness began eight months ago, when he says that he became stiff all over, entirely preventing him from getting about. This cleared up and he began to have some frontal headache. Four months ago he began to lose his eyesight gradually. The headache continued. He had chills one year ago, but has had no return of them. He never had any weakness in the arms or legs. There has been no other pain, nor has there been loss in weight.

"On admission he is found to be a large, well-nourished man, the temperature 101°, pulse 102, respirations 26, the tongue large, flabby, and coated white; the breath offensive. There is no cough. He has now almost lost sight, but can tell day from night. He says that if he looks in one direction for some time he can faintly outline the object. The tongue is protruded straight. Hearing, taste, and smell seem natural. The fingers when extended seem steady. There is decided mental hebetude, and when asked a question it takes him a long time to formulate an answer. His memory has been steadily failing and is now quite bad. No anesthesia can be detected. He says that he never received any injury to the head. He lies quietly in bed, apparently uninterested in what is going on about him.

"The heart sounds, as heard at the apex, are clear and sharp, but heard at the aortic cartilage, the first sound is indistinct. No murmur can be detected. The lungs and abdominal organs are normal.

"TREATMENT. Potassium iodide in 10-grain

doses, three times a day. Calomel, in $\frac{1}{6}$-grain doses, every hour during the day.

"*December 10.* The bowels have not yet been moved. Temperature down to normal. Six P.M. Urine examined and found to have a specific gravity of 1032; acid; no albumin or sugar.

"*12th.* Bowels were moved thoroughly yesterday; mental condition the same.

"*15th.* The bowels have been very costive, requiring calomel, salts, enemata, etc., to move them. No change in the mental condition or sight.

"*17th.* The eyes were examined by Dr. George C. Harlan. He found no light-perception. In the right eye there is extensive hemorrhagic retinitis with superficial and deep hemorrhages scattered over the fundus, rendering it difficult to see the disc. The margin of the disc is obliterated. There is extensive edema. Near the macula are several yellowish-white patches suggestive of hemorrhage. The condition of the left eye is about the same.

"*19th.* Urine again examined. Specific gravity 1018; amber-colored; acid; no albumin; no casts.

"*27th.* Thinks that he can see somewhat better, especially at a distance of about six feet.

"*January 9, 1890.* Eyesight about the same. Passes urine involuntarily.

"*11th.* Yesterday, on awakening, he saw distinctly for about five minutes. This is the only time since admission that this occurred.

"*16th.* Sight is certainly better, especially in the mornings. He has complained of some pain in the eyeballs for the past ten days.

"*20th.* On the 17th he had a chill with a temperature of 101°, without apparent cause. The next morning the temperature was normal, and has remained so."

The patient then left the hospital.

After leaving the hospital he received no medi-

cal attention. The principal trouble observed by the patient and his friends was the loss of eyesight, which had sunk to simple perception of light. During the day he sat about the house, and at night he was able, unaided, to go up three flights of stairs. In fact, a few days before his death, he dressed himself and came down stairs without assistance. There was no motor disturbance in any part of the body—no weakness of the muscles. Intelligence did not seem to be materially impaired. His memory for past events was retained. In illustration of this it may be stated that two weeks before his death he was visited by friends whom he had not seen for years, and conversed with them intelligently and rationally about events that had occurred ten years or more previously. For recent events, however, memory was defective. The drawling speech continued, and to this was added slight amnesic aphasia. Occasionally, he would be unable to remember a certain common word which he wished to use, but when it was suggested he would recognize it and be able to pronounce it without difficulty. Hearing was unaffected. The sense of smell was good, but whether or not there was any difference between the two sides could not be ascertained. The bowels and bladder acted normally.

I was called to see him at midnight on December 24, 1891, the statement being that he was in a stupor from which he could not be roused. When I reached the house, however, he was awake. He recognized me when I spoke to him, and his tongue was protruded normally. He lifted first one arm and then the other, and moved the legs at command. He had high fever, injected conjunctivæ, and other symptoms which caused me to believe that he was suffering from an attack of influenza, prevalent at that time. The following day his con-

dition was about the same, but next day he passed into a comatose condition and died that evening.

With the assistance of my brother, Fred. S. Morrison, the autopsy was made fourteen hours after death, the examination being confined to the head. The body was that of a stout, well nourished man, with nothing abnormal on inspection. The scalp was fully one-half inch in thickness, there being a quarter-inch layer of fat. The bone was of normal thickness, and the dura but slightly adherent to its inner surface. The dura was found strongly adherent to the pia mater along each side of the longitudinal fissure, and a portion of it was removed with the brain. A large tumor was at once evident in the left frontal region. The brain and tumor were removed as carefully as possible. It was found that the tumor had eroded the left half of the cribriform plate of the ethmoid, so that there was a direct communication between the interior of the skull and the nasal cavity.

From the inner surface of the frontal bone, one inch to the left of the median line and one inch above the orbital plate, there sprang a conical projection of bone. This had a base one-half inch in diameter, and projected three-eighths of an inch above the surface of the bone. Corresponding with this exostosis, there was a depression in the dura mater and in the new-growth. Inspection of the external surface of the bone showed no depression and no evidence of injury.

Examination of the brain and tumor, after removal, showed that the growth had occupied the greater part of the left anterior fossa of the skull. The mass is irregularly pyramidal in shape, its base, corresponding with the left half of the frontal bone, being attached to the inner surface of the dura. The base of the growth measures two and one-half inches vertically by three and one-quarter inches

transversely. The tumor extends backward into the frontal lobes two and three-quarters inches. After preservation in alcohol for five months, the weight of the mass is five ounces, its volume nine cubic inches, and it displaces five fluidounces of water. The orbital plate of the frontal bone was not displaced, and there was no exophthalmus. The tumor was not adherent to the brain tissue, but seems to be a dural tumor originating at the position of the projection of bone already mentioned, and thence extending gradually, pressing backward the frontal convolutions. Internally and externally the tumor was covered by cerebral tissue, but underneath, the brain-tissue has been displaced and absorbed in the position of the cribriform plate, and the bone itself has been destroyed. The tumor was readily lifted from its cavity, and, in fact, care was necessary to prevent it from falling out when the brain was removed.

The growth has been examined microscopically by Dr. C. W. Burr, who pronounces it to be a spindle-celled sarcoma.

The special features of this case, as elicited by post-mortem study, are: The evidences of a slowly-developing and steadily-progressing lesion, accompanied by pain in the head, not distinctly localized, not especially severe; a single epileptiform convulsion, neuro-retinitis, loss of memory, slowness of mental processes, slowness of speech, and slight amnesic aphasia. To these may be added absence of motor disturbances, and absence of signs of involvement of the special senses other than sight.

Referring to lesions in this region, Dr. Seguin says:[1]

[1] Pepper's System of Medicine, vol. v, p. 89.

"Focal lesions of the frontal lobe produce no specific symptoms, and cannot be directly diagnosticated, unless they extend as far caudad as the base of the second or third frontal gyri. The forward mass of the frontal lobe, including the orbital lobule, appears to be inexcitable and insensitive. Even psychic symptoms do not necessarily appear after the loss of a considerable amount of cerebral substance from this region. The diagnosis of tumors, abscesses, etc., in this part of the brain must be made by taking into consideration the seat of the pain, the presence of cicatrices or other etiological indications, the general signs of cerebral irritation and compression, but, after all, usually by exclusion. In some cases unilateral anosmia is produced."

Dr. Mills, speaking of lesions in this part of the brain, says:[1]

"Lesions of the prefrontal lobe, although this is one of the so-called latent districts of the brain, have, in a large percentage of the carefully-studied cases, shown distinct manifestations. The symptoms are largely psychical, and, unfortunately, the physician is not usually well trained to study such phenomena. Mental disturbances of a peculiar character occur, such as mental slowness and uncertainty, want of attention and control, and impairment of judgment and reason. Closely studied, the inhibitory influence of the brain both upon psychical and physical action is found to be diminished. Memory is not seriously affected, although a continuous train of thought cannot well be followed, and complex intellectual processes cannot be thoroughly performed."

A review of the history of this case, as thus imperfectly elicited, seems to indicate that, had the patient been under careful observation, a diagnosis of the probable seat of the growth would have been made, and, possibly, with sufficient certainty to have rendered an exploratory operation justifiable. Could

[1] Transactions of the Congress of American Physicians and Surgeons, vol. i, p. 272.

the tumor have been located some months or a year before death, its removal would have been comparatively easy.

As an example of a tumor in almost exactly the location of the one shown to-night, and in which the growth was successfully located and removed, I may briefly refer to a case reported at the Ninth International Medical Congress, by Dr. F. Durante,[1] of Rome, Italy:

"The patient, a woman, aged thirty-five years, came under observation in May, 1884. Three months before, the left eyeball had begun to be displaced downward and outward. For a year or more the sense of smell had been lost. Memory had become impaired, particularly in regard to remembering names, and she experienced a peculiar sensation of vacuity about the body, which caused her to feel uncertain in her movements. There had been a change in disposition. From being happy and bright, she had become sad and melancholic. Dr. Durante diagnosticated a tumor of the anterior lobe of the brain, basing the diagnosis on the loss of memory, the absence of the sense of smell, the change in disposition, and the displacement of the eyeball. The skull was opened above the orbit by means of a sharp scalpel and hammer, and a tumor weighing seventy grams (two and one-half ounces) was enucleated. The patient made a rapid recovery, with return to the normal mental condition, and was living and well three and a half years later."

Since the preparation of this paper, a case under the care of Dr. Ferrier has been reported,[2] and, as in many of its features it is very similar to the one recorded to-night, I have appended a brief abstract of

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[1] Transactions of the Ninth International Medical Congress 1887, vol. i, p. 570.

[2] Lancet, June 4, 1892.

it. In the symptoms manifested, in the mode of death, and in the location of the growth, the two cases are almost identical:

"The patient, a male, forty years of age, was admitted to the hospital June 30, 1891. Seventeen years before he had been thrown from a carriage, and had remained unconscious for a week. Following this accident, however, he remained perfectly well until a few months before coming under observation. The symptoms noted were great failure of memory, incapability for sustained effort, marked apathy, and a tendency to fall asleep. There were no indications of motor paralysis, though it occasionally appeared as if there were slight relative weakness of the right angle of the mouth. Vision, hearing, and tactile sensibility were good. Owing to the mental condition, no satisfactory conclusion could be reached in regard to smell. Ophthalmoscopic examination revealed typical double optic neuritis. The patient denied the existence of pain, although there seemed to be a slight tenderness over the left fronto-parietal region on strong pressure. There was no material change in the condition until October, when he exhibited greater dulness. He did not know where he was, frequently could not tell his name, and, when asked to sign his name, wrote nonsense. The right pupil was slightly larger than the left. There sometimes appeared to be relative weakness of the right leg, and the gait in general was tottery. This condition continued practically unchanged until January 23, 1892, when, during the prevalence of the influenza epidemic, the patient developed symptoms of this malady. The next day the temperature had reached 104°, and he died comatose on the 28th, the temperature having risen to 106° immediately before death. At the autopsy it was found that the anterior portion of the left frontal lobe was occupied by a large tumor, three inches from above downward, and two inches from before backward. The dura mater was adherent to the front of the growth, and it was thought probable that the growth had commenced in this structure and grew backward, compressing the frontal lobe."

Dr. Ferrier, in commenting upon this case, in regard to tumors in this situation, says:[1] "It is not until the tumor presses backward and, directly or indirectly, disturbs the functions of the central and posteriorly situated convolutions, that motor or sensory symptoms declare themselves; and until these have occurred, or until there are signs of implication of the nerves or other structures in the anterior fossa, an accurate diagnosis of the position of the tumor cannot be made with certainty, inasmuch as loss of memory and impaired power of concentration may also be produced by diffuse lesions or lesions which cause general disturbance of the brain. Of the structures in the anterior fossa, the olfactory tract is especially apt to suffer, but, on account of our patient's mental condition, it never could be ascertained with certainty whether there was any implication of smell in the one nostril or the other. During life, however, I had expressed the opinion that the case was in all probability one of tumor of the frontal region, but its precise position, whether deeply seated or superficial, or connected with the corpus callosum, did not appear to me sufficiently clear. For this reason, though I frequently considered the advisability of operation, I did not think it well to interfere until definite localizing symptoms should declare themselves; but the patient was carried off by an intercurrent malady before this event occurred. The necropsy, however, proved that the tumor might have been reached and, in all probability, enucleated by trephining over the left frontal lobe anteriorly."

[1] Loc. cit.